Claims

1. A jet-injector device comprising a) a housing, b) a pressure chamber for a liquid to be ejected attached to or enclosed in the housing, the pressure chamber having at least one opening and at least one movable or collapsible wall or wall segment and c) a pressurizing mechanism attached to or enclosed in the housing operable to apply, directly or indirectly, force in a force chain between the housing and the wall to pressurize the pressure chamber content for ejection of a liquid jet through said opening, the mechanism comprising at least a force generator and optionally a transmission between the force generator and the wall, c h a r a c t e r i z e d i n the improvement comprising, an in-elastic element serially arranged between the force generator and the wall.

2. The device of claim 1, wherein the element is designed to remove work energy forms, at least partially irreversibly, from force applied to at least two parts of the element displaceable, externally or internally, with respect to each other.

3. The device of claim 2, wherein the element is designed to remove work with a friction mechanism.

4. The device of claim 1, wherein the element comprises a viscous damper component.

5. The device of claim 1, wherein the element comprises a mechanical friction component.

6. The device of claim 5 wherein the element comprises a deformable inelastic component.

7. The device of claim 6, wherein the element comprises a collapsible container part.

8. The device of claim 6, wherein the element comprises a shape permanent container.

9. The device of claim 8, wherein the container comprises at least one movable mass.

10. The device of claim 9, wherein the container comprises particles to a filling degree of at least 50 % bulk volume.

11. The device of claim 1, wherein the element has a minimum stroke length, when measured at the wall, of at least 1mm, preferably at least 2 mm and most preferably at least 3 mm.

12. The device of claim 1, wherein the element comprises a stroke length limiter.

13. The device of claim 12, wherein the limiter provides an over length increasing counterforce.

14. The device of claim 13, wherein the limiter comprises an elastic component.

15. The device of claim 14, wherein the limiter is arranged to allow the element to come into equilibrium with different forces transmitted during operation of the device.

16. The device of claim 1, wherein the element has an internal ratio between external and internal stroke lengths.

17. The device of claim 16, wherein the ratio is arranged to amplify internal stroke length.

18. The device of claim 1, wherein the element has a force ratio, as defined, of less than 100%, preferably below 90%, below 75%, below 50% or below 25%.

19. The device of claim 1, wherein the element is arranged in the interface between hard and soft force chain parts, as defined.

20. The device of claim 1, wherein the element is positioned is in the front-most part of the force chain at or close to the pressure chamber movable wall, or a piston rod for the wall.

21. The device of claim 1, wherein the element is arranged for the purpose of damping out existing ringing.

22. The device of claim 21, wherein the element is arranged to allow repeated strokes.

23. The device of claim 22, wherein the element is a combination element of at least one in-elastic component and at least one elastic component.

24. The device of claim 1, wherein the element is arranged for the purpose of avoiding rebound effects at impact.

25. The device of claim 24, wherein the impact results from a gap in the force chain.

26. The device of claim 25, wherein the element is a combination element of at least one in-elastic component and at least one elastic component.

27. The device of claim 26, wherein the element is a deformable element.

28. The device of claim 1, wherein the mechanism is arranged to give an initial penetrating peak force followed by a lower injection force.

29. The device of claim 28, wherein the elements is arranged to provide an initial counter-force.

30. The device of claim 29, the element is arranged not to yield substantially below forces corresponding to at least 10% of the maximum force value in the initial peak, preferably not below 20% and most preferably not below 30% of this force.

31. The device of claim 29, wherein the element is arranged to yield below the maximum peak value, preferably below 90% and most preferably below 80% of this value.

32. The device of claim 31, wherein the element is arranged to begin yielding roughly at a force value where a force line for the main spring intersects with the initial peak.

33. The device of claim 32, wherein the element is arranged to increase its counterforce on displacement of its parts.

34. The device of claim 32, wherein the element is arranged to allow increased counter-forces at least to forces corresponding to the maximum force value in the peak

35. The device of claim 28, wherein the counterforce comprises a resistance force of the element in-elastic component, disregarding any elastic element component, the resistance force being above 10%, preferably above 20% and most preferably above 30% of the maximum peak force and is below 90%, preferably below 80% and most preferably below 60% of the maximum peak force.

36. The device of claim 1, wherein the element is arranged to provide a resistance force of the element in-elastic component, disregarding any elastic element component, the resistance force being above 10%, preferably above 20% and most preferably above 30% and is below 90%, preferably below 80% and most preferably below 60% of the momentary force transmitted in the force chain.

37. Use of the device according to any of claims 1to 36 to prevent aspiration pressures in the pressure chamber.

38. A method for generation of a high speed liquid jet, the method comprising the step of pressurizing the liquid when in a pressure chamber, having at least one opening for the liquid jet and having at least one movable or collapsible wall or wall segment, by applying a pressurizing force on the wall, c h a r a c t e r i z e d i n the improvement comprising the steps of i) applying a primary force, directly or indirectly, on one part of an in-elastic element, ii) applying the pressurizing force by another part of the element, to thereby press the element between the primary force and the pressurizing force and iii) dissipating energy in the element.

39. The method of claim 38, including the step of accelerating a mass with the primary force.

40. The method of claim 39, wherein the accelerating step takes place before applying the pressurizing force.

41. The method of claim 38, including the step of squeezing the element between the primary force and a support prior to applying the pressurizing force.

42. The method of claim 41, wherein the squeezing step comprises the step of allowing the element to respond with a counterforce substantially in equilibrium with the primary force.

43. The method of claim 38, wherein the dissipating step comprises the step of allowing the element to oscillate.

44. The method of claim 38, wherein the dissipating step comprises the step of allowing the element to collapse.

45. The method of claim 38, wherein the dissipating step comprises the step of allowing the element to change mass center.

46. The method of claim 38, wherein the element is designed according to any characteristic of claims 1 to 37.

47. Use of the method according to any of claims 38 to 46 to prevent aspiration pressures in the pressure chamber.

48. A jet-injector having a pressure chamber for a liquid and a mechanism for pressurizing the liquid in the pressure chamber, the jet-injector being operable to perform injections without aspiration pressures in its pressure chamber.